

L. COES.
Manufacture of Wrench Heads.

No. 142,771.

Patented September 16, 1873.

Fig. 1.

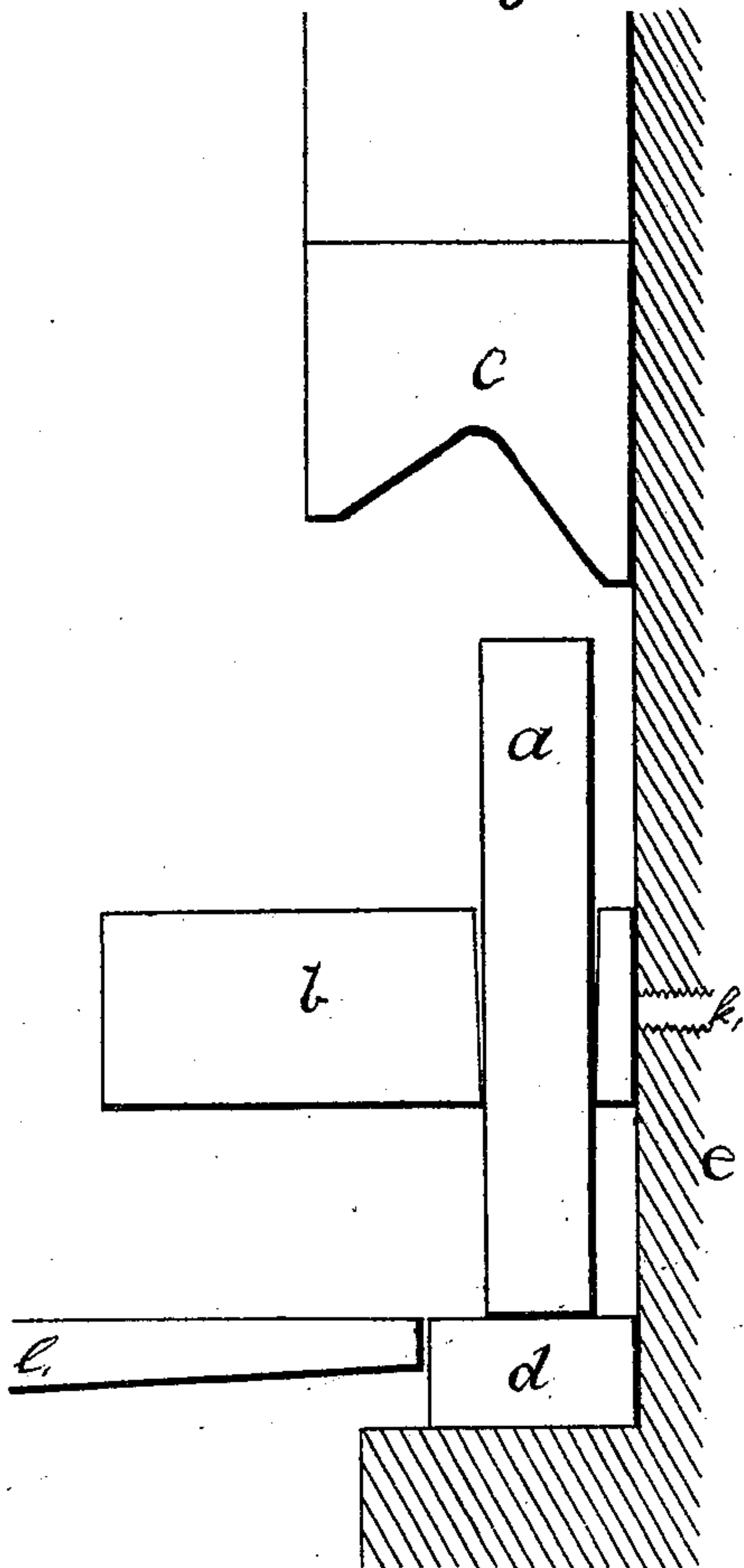


Fig. 2.

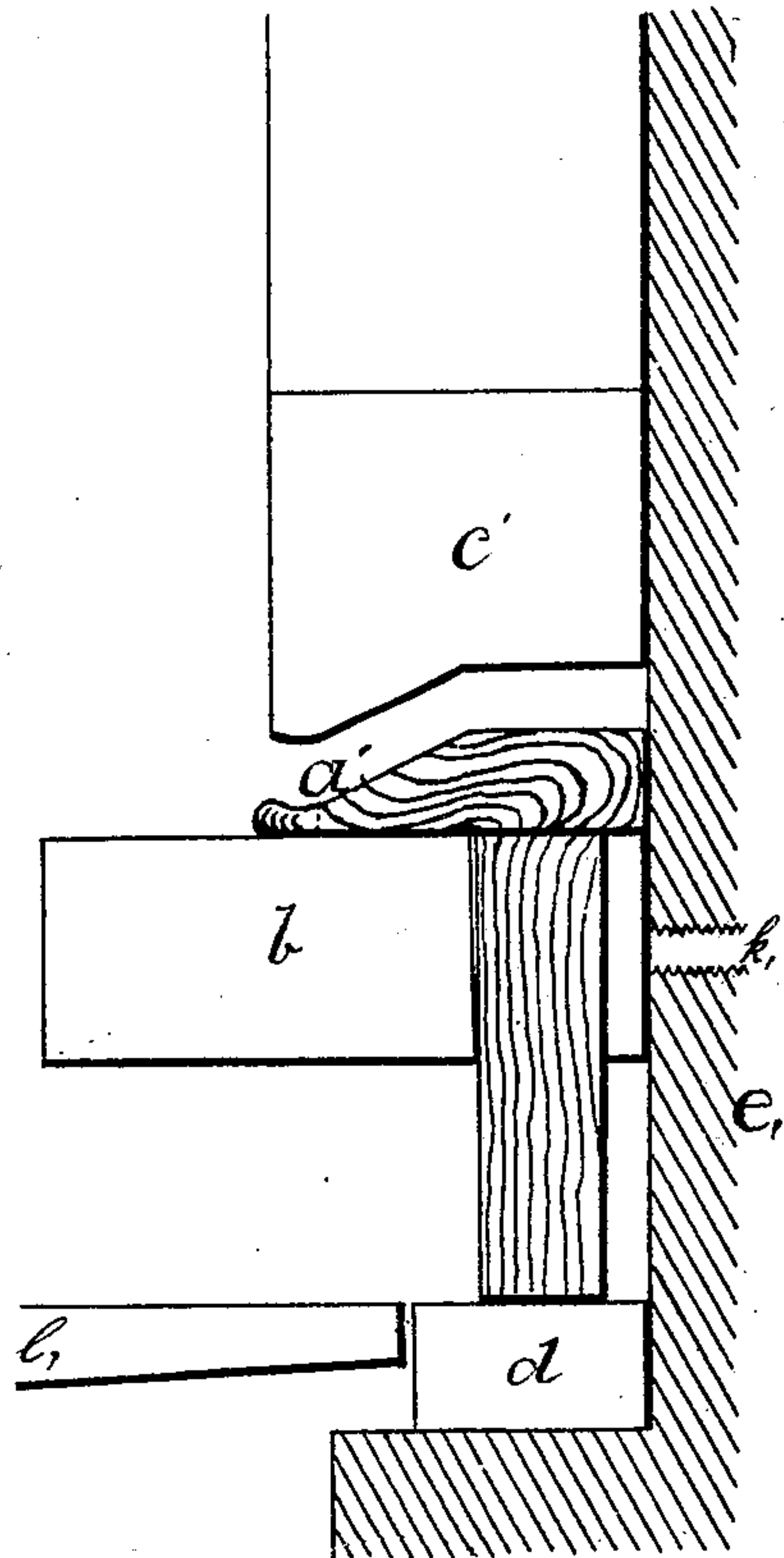


Fig. 3.

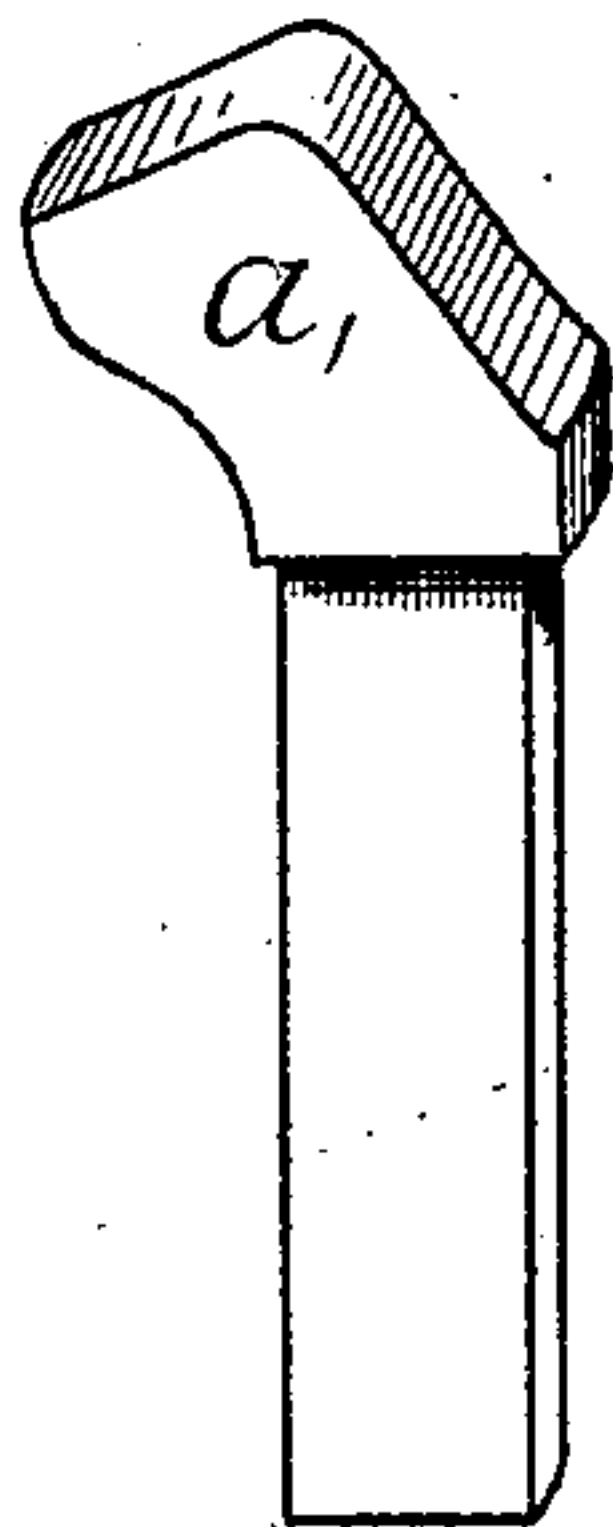
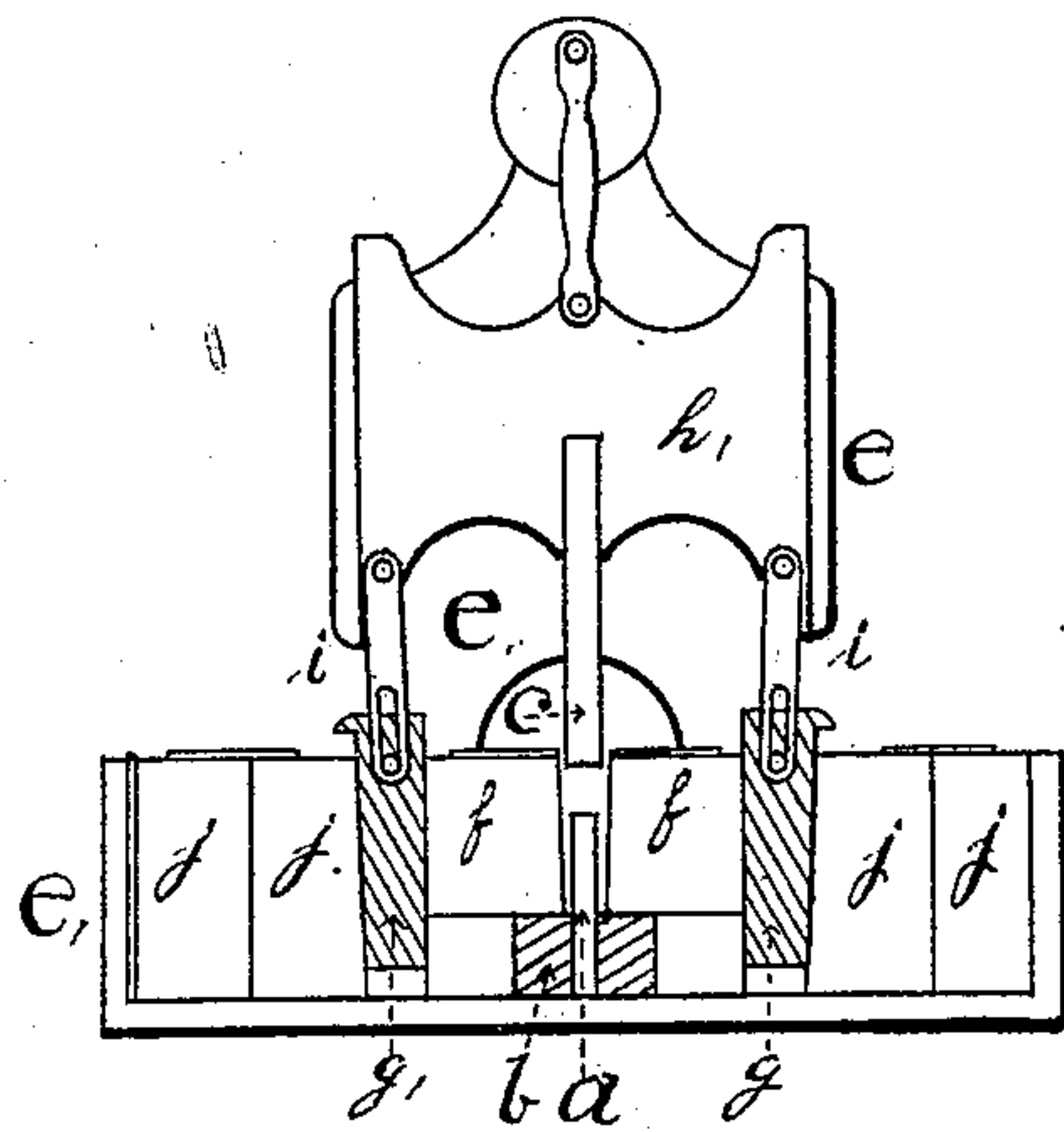


Fig. 4.



Witnesses;
J. Henry Hill.
H. C. Rice.

Inventor;
Loring Coes.
Per W. X. Stevens. Atty.

UNITED STATES PATENT OFFICE.

LORING COES, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN THE MANUFACTURE OF WRENCH-HEADS.

Specification forming part of Letters Patent No. 142,771, dated September 16, 1873; application filed July 14, 1873.

To all whom it may concern:

Be it known that I, LORING COES, of the city and county of Worcester and State of Massachusetts, have invented an Improvement in the Manufacture of Wrench-Heads, of which the following is a specification:

The object of my invention is to economically forge wrench-heads on bars of iron which have been drawn in the rod to suitable shape for wrench-bars by the use of peculiarly-formed dies in a power or drop press.

Figure 1 is a vertical section of the first die *c*, shoulder-block *b*, foot-block *d*, foot-lever *l*, a portion of the main frame *e*, and the rough bar of iron or blank *a* in position to receive the first stroke. Fig. 2 is a similar section of the same parts, excepting upper die *c'*, which is in this figure the finishing-die, showing the blank as formed into a wrench-head, and indicating the direction of the fiber of the iron, as shown by action of vitriol. Fig. 3 is a perspective view of the blank as shaped by the first die. Fig. 4 is a longitudinal vertical section of a power-press, showing the working position of the principal parts, arranged according to my invention.

To forge wrench-heads by my process I cut blanks of a gaged length, which experience has established as suitable to form a wrench bar and head without waste from rods of iron which have been rolled to a form and size suitable for the straight part of the wrench-bar; second, heat one end of the blank red; then draw forward (to the left in Figs. 1 and 2) shoulder-block *b*, and drop the cold end of the blank through the hole in shoulder-block *b* onto foot-lever *l*; then slide block *b* back to place, carrying blank *a* onto foot-block *d*; then give a single blow with upper die *c*, Fig. 1. The peculiar form of die *c*, Fig. 1, tips the top of blank *a* to the side that is to form the jaw of the wrench, and partly heads it, giving the shape shown in Fig. 3. The blank, Fig. 3, is now returned to the fire, and after raising to the proper heat, is treated by a similar process and machine to that just described in all respects, excepting that the upper die *c'* is substituted for the die *c*, which is formed to give the finished shape to the top of the wrench-head, shown at *a'*, Fig. 2.

The whole may be done on one machine by

changing the dies after the first blow, but not with as much economy as with two, since much of the heat remains after the first blow that might assist the second heating.

Experience has shown me that wrench-heads cannot be formed by upsetting against the end of the bar with the arbitrarily-formed finishing-die *c*, Fig. 2, alone, without such serious strain and wear on the dies and machine as to be unprofitable. This is because the slant, which the upper die must have to shape the wrench-jaw, has such a forcible tendency to drive the iron away from the point of the jaw, that it is almost impossible to form a full-pointed jaw by this means. It has, therefore, been my study, and the subject of long-continued experiment, to establish a simple preparatory process that should put the fibers of iron in position to be drawn, rather than upset, by the finishing blow. This I have succeeded in doing by means of the upper die *c*, Fig. 1, which first bends the blank *a* to one side, then in the same blow partly upsets and partly draws the blank into the form shown in Fig. 3. With this preparation one blow from die *c'*, Fig. 2, readily draws out the full head and jaw, enough iron shooting beyond the point of the jaw to be trimmed off and leave a round end. The sides of the head are kept in form by the old-styled cheek-dies *f f*, Fig. 4, and the overset of the head is controlled by set-screw *k*, which gives a slight adjustment to shoulder-block *b*, Fig. 2. Block *b* may have dies set in to shoulder the blank, but it serves as a mere heading-tool without any clamping arrangement. To remove the forging from shoulder-block *b*, a foot-lever *l*, Figs. 1 and 2, (the drawing here shows only relative positions without proportion of parts) is arranged to strike against the lower end of the forging and drive it out, when block *b* is withdrawn for that purpose.

A minor feature of my invention is the combination by which cheek-dies *f f* are firmly held while the blow is given, and then released to allow free egress to the forging. Wedges *g g*, Fig. 4, slide vertically between dies *f f* and packing-blocks *j j*, which fill to the walls of the machine-frame *e*. Wedges *g g*, as shown in Fig. 4, are drawn up by slotted links *i i*, which connect with hammer-head *h*. Ham-

mer or press head *h*, driven by any suitable power, carries the upper die *c*, and when it descends wedges *g* are drawn down by weights or springs, pressing cheek-dies *f f* to position, and firmly holding them at the proper distance apart to shape the cheeks at the time the head is upset by the upper die *c*. Slots in links *i i* allow the continued descent of head *h* till die *c* has done its work.

The reverse of the above-described operation, assisted by a spring (not shown) between dies *f f*, loosens all, so that the forging may be removed.

I am aware that wrench-heads have been forged by first upsetting a head, similar to a square bolt-head, directly against the fiber of the iron, whereby the iron offers its greatest resistance to being worked, and is so distributed as to be destructive to the finishing-dies. But by my process the blank is first so bent and shaped that during the following forging process the iron is caused to slip among its fibers, as when drawn under a hammer. The iron is also arranged, by this first shaping, to be easily set in the desired form by the head-finishing die.

I have tried merely bending the bar to an angle, as preparatory to the second or finishing process, but do not find it as satisfactory as both bending and upsetting to the shape shown in Fig. 3.

By thus accommodating my process to the nature of the iron it offers much less resistance to assuming the desired form, wears the dies less, and may be worked by much lighter machinery than by the old process.

What I claim as my invention, is—

1. The process of forming a wrench-head by first forming, by means of dies, a head upon the bar, substantially like *a*, and then completing the forging by means of the second set of dies, substantially as described.

2. Wedges *g*, connected to hammer-head *h* by means of slotted links *i*, when operating in combination with packing *j* to close cheek-blocks *f*, as and for the purpose specified.

LORING COES.

Witnesses:

J. HENRY HILL,
H. C. RICE.